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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,191	06/30/2006	Nobuo Kushibiki	71,051-021	8417

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EXAMINER	
NELSON, MICHAEL B	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
11/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,191	KUSHIBIKI ET AL.	
	Examiner	Art Unit	
	MICHAEL B. NELSON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4,5,8-12,18,24 and 25* is/are pending in the application.

4a) Of the above claim(s) *13-17 and 19-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4,5,8-12,18,24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendments filed on 07/28/09 have been entered. Claims 4, 5, 8-12, 18, 24 and 25 are currently under examination on the merits. The previous 112 2nd paragraph rejection is withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 4, 5, 8-12, 18, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birdsall et al. (U.S. 4,198,131) in view of Amano et al. (U.S. 5,672,672).

5. Regarding claims 4, 5, 24 and 25, Birdsall et al. discloses a curable polysiloxane composition which includes a base resin, (i.e. instant component A), of methylvinylphenylpolysiloxane (Example 1, Base resin (I), C5, L50-56). The relative amount of phenylsiloxane to methylvinylsiloxane is shown as being 75:25 (Table II, Example A), which

reads on the instant ranges. It would have been obvious to one having ordinary skill in the art to have adjusted the degree of polymerization (i.e. the average molecular weight) of the base resin in order to optimize the hardness (i.e. durometer property, Table III) of the final resin while still maintaining sufficient flow characteristics (i.e. melting point) to enable easy molding before being cured (i.e. liquid under 100 degree Celsius, C3, L55-60). The polymerization of the monomers would result in more than three vinyl groups being present in the overall polymer molecule.

6. Base resin (I) is also disclosed as containing a phenylmethylvinylsiloxane diluent (C5, L56), which is earlier disclosed as being a low molecular weight polysiloxane (i.e. oligomer) having a low viscosity (C2, L60-65). Given the teaching of Birdsall et al. towards the characteristics of the diluent it would have been obvious to one having ordinary skill in the art to have adjusted the molecular weight (i.e the amount of Si in the overall polymer molecules) in order to sufficiently reduce the viscosity of the diluent to achieve the taught diluting effects.

7. The base resin (I) of Birdsall et al. is disclosed as being mixed with a crosslinking agent which is a methylphenylhyrdogensiloxane resin (i.e. instant component B) (C6, L1-5). The amount of methylhydrogensiloxane in the compound would result in more than two silicone bonded hydrogens in the final polymer molecule.

Birdsall et al. does not specifically disclose the use of the polysiloxane based resin composition as being used with waveguides, even though its optical use is disclose (See Abstract).

Amano et al. discloses a polysiloxane based resin composition which is used in a waveguide application (See Abstract, and Fig. 1 and 2). The use of a polysiloxane resin blend is

disclosed as being particularly advantageous due to the ability to control the relative refractive indexes of the materials in core and clad parts of the waveguide through controlling the relative weight percentages of the constituents in the blend for each material (C22, L50-65). Controlling the aromatic group content in each blend is specifically disclosed as one such refractive index effecting factor (C19, L55-65). The polysiloxane blend of Birdsall et al. would be a particularly good blend to use in the manner as taught by Amano et al. (i.e. controlling the refractive index of the blend to make core and clad components of a waveguide) because of its high mechanical strength (C5, L30-45).

The inventions of both Birdsall et al. and Amano et al. are drawn to the field of optical polysiloxane resin compositions and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have used the resin composition of Birdsall et al. as a waveguide material as taught by Amano et al. for the purposes of imparting increase commercial applicability to the invention.

Regarding the less than 2% hydroxyl or alkoxy group limitation, Example 1 of Birdsall et al. results in a resin that is has no hydroxyl or alkoxy groups (C5, L50-C6, L35) and therefore reads on this limitations.

Regarding claims 8-12 and 18, modified Birdsall et al. discloses all of the limitations as set forth above. Additionally, Amano et al. discloses a waveguide made from a polysiloxane resin composition in which the core and the clad structural components are made of the same general resin with different relative amounts of components (Example 2, C22, L20-C23, L25). Amano et al. also discloses that the controlling of the refractive index of the two structural components (core and clad) may be adjusted by, inter alia adjusting the amount of aromatic

group containing polysiloxane components in the overall resin composition (C19, L40-65). Furthermore, having knowledge that aromatic group containing polysiloxane compounds have a different index of refraction than non-aromatic containing polysiloxane compounds, one having ordinary skill would adjust the relative amounts of these materials in a blend in order to "fine-tune" and optimize the refractive index of the overall blend. The waveguide of Amano et al. is also a film type wave guide, (Fig. 1 and 2, and Example 2, C22, L20-C23, L25).

Response to Arguments

8. Applicant's arguments filed on 07/28/09 are considered moot in light of the new grounds of rejection which were necessitated by applicant's amendments. Arguments which are still deemed to be relevant are addressed below.

9. Applicant alleges that the disclosure at C3, L21-26 of Birdsall acknowledges the presence of OH groups in the final resin; however, the acknowledgement actually shows that these constituents are present, if at all, in trace amounts that "do not materially affect the functioning of the composition." The disclosure to their trace presence in the resin composition would not lead one having ordinary skill in the art to conclude that they are present at more than 2%. Moreover, the disclosure at C3, L21-26 recites that the resins **can** contain trace hydroxyl and alkoxyl groups. Example 1 of Birdsall et al. does not contain any hydroxy or alkoxy groups.

10. While Birdsall et al. discloses only the possibility of trace amounts of hydroxyl groups in general and discloses a specific example with no hydroxyl groups, even if there were hydroxyl groups present in the resin of Birdsall et al., one having ordinary skill in the art would recognize that the degree of cross-linking of the resin would affect how many of these residual groups, if there are any at all, are present in the final resin. For example, Amano et al. discloses that **if** the

polysiloxane has hydroxyl groups (or alkoxy groups) the amount of crosslinking agent can be increased to eliminate the groups in the final product (C15, L40-C16, 40). One having ordinary skill in the art would find it obvious to achieve a high degree of crosslinking in an optical resin in order to achieve superior optical properties and superior mechanical properties (i.e. the "clear hard material" mentioned at C3, L20-26 of Birdsall et al.). In any case, Birdsall et al. discloses in example 1 a resin that has no hydroxy or alkoxy groups.

11. Applicant alleges that certain steps (i.e. those mentioned in [0025] of the instant application) are required to produce less than 2% hydroxyl and alkoxy group concentrations; however, there is no evidence that these are the only methods to produce a resin with such a low amount of these groups. Since Birdsall et al. discloses one such method (i.e. Example 1), absent evidence that the product of the method of Birdsall would in fact posses more than 2% hydroxyl and alkoxy groups, there is insufficient evidence that applicant's methods are the only methods for obtaining this result. The examiner also notes that the methods are not claimed.

12. Applicant continues to argue against the combination of Birdsall and Amano. The examiner maintains that the two references are obviously combined as an optical resin in general (Birdsall) and a specific use for that particular type of optical resin as a waveguide (Amano). Applicant argues that the added limitation makes it even less obvious to combine the two references because it would not be obvious to control the amount of hydroxyl and alkoxy groups for a waveguide. The examiner first notes that Example 1 of Birdsall makes this argument moot since the resin already possesses no hydroxyl or alkoxy groups. Even so, the motivation for high crosslinking is not limited to waveguides or polysiloxanes and was a known principal of

optically transparent resins at the time of the invention to produce clear and hard materials. Hence the new limitation does nothing to prevent the combination of the two references.

13. Applicant continues to argue against the "intermixing" properties of the resins; however there are no claimed limitations relating to this property and there is no evidence that the cured resins of the prior art references would intermix in the manner the applicant is alleging to the point that where it would be prevented from being used as a waveguide at all.

14. Applicant also argues that the mechanical properties (i.e. hardness) of the Birdsall resin are immaterial to a wave guide. The examiner disagrees. The mechanical properties of Birdsall would obviously make it beneficial in any final application that requires physical manipulation. Amano even calls for a waveguide with high environmental resistance (C2, L15-17).

15. Applicant argues that there is nothing to distinguish Birdsall's resin from any other polysiloxane resin. The examiner disagrees because the Birdsall resin is optically transparent and hard. The examiner also notes that there is no burden to show why the particular polysiloxane of Birdsall et al. would be advantageous over all the other polysiloxane resins known at the time of the invention. There is a clear motivation to use the resin of Birdsall in a waveguide and simplicity of the motivation does not invalidate it.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art Unit 1794

/MN/
10/26/09